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Public Buildings and Emergency Management
House Transportation and Infrastructure Committee

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Congresswoman Norton and members of the subcommittee, thank you for inviting me here today to offer some thoughts the greening of the National Capital Area. I appear here today on behalf of the Chesapeake Bay Foundation's nearly 200,000 members living in all 50 states and many countries around the world.

Although we know quite a bit about green buildings generally, (our Bay-side headquarters in Annapolis was the nation's first LEED "Platinum" building) I'm going to focus my remarks today on a particular subset of "greening" activities: those intended to protect and restore the local water quality of the region, which has been and in many cases continues to be severely degraded.

First, I want to place our National Capitol Region into the proper geographical context from a water perspective. The key geographic concept is the watershed, or the land area where all water runs to a particular stream, river, or Bay. The entire National Capitol area lies in the watershed of the Potomac River, except for parts of central, eastern and southern Prince Georges County, where the streams run east and south to the Patuxent. Within the Potomac watershed, most of the District of Columbia and the Maryland suburbs lie either in the Rock Creek watershed or in the Anacostia watershed. The Northern Virginia suburban area is more diverse, with several relatively large watersheds including Four Mile Run, Cameron Run, Difficult Run, Accotink Creek, Little Hunting Creek, and the Occoquan River, as well as some smaller ones. The Potomac and the Patuxent watersheds are parts the much larger

Chesapeake Bay watershed, which encompasses 64,000 square miles in six states and the District of Columbia.

For decades, most of the National Capital Area's streams and rivers have suffered from severe water quality degradation as a result of human-produced pollution. Perhaps the best known of the region's degraded rivers is the Anacostia, which flows only about a mile from here and captures polluted runoff and occasionally untreated sewage from the Capitol complex and much of the District's federal property. The Anacostia is officially listed as "impaired" for sediment, nutrients, bacteria, toxic chemicals, and trash.

However, many of the region's other streams are highly polluted as well. Four Mile Run, a heavily urbanized watershed less than 1/8 the size of the Anacostia's, has suffered badly from a mix of sewage and urban runoff problems since the 1940s, although most of its problems today are related only to runoff. Most of the remainder of the region's streams have been similarly degraded, sometimes from untreated or inadequately treated sewage, sometimes from polluted urban runoff known by engineers and water quality managers as "storm water", and sometimes from both. The severity of the degradation is often related to the density of population and the era in which settlement occurred, with the watersheds that provide a home to the earliest and densest settlements experiencing the most severe effects, stemming largely from the now-discredited belief that humans could simply use waterways for pollution disposal with impunity.

Throughout the National Capitol Region, the two principal causes of degraded water quality are 1) household, commercial and industrial wastewater, and 2) storm water runoff from rooftops, streets, and yards which has picked up oil, grease, chemicals, fertilizers, compounds related to air pollution, trash, and other contaminants.

The oldest, central parts of the District of Columbia are served by a "combined" sewer system, where sewage and storm water runoff are conveyed in a single set of underground pipes to the Blue Plains advanced wastewater treatment plant. The rest of the area is served by separate systems, wherein sewage is

conveyed to the wastewater plant through one set of pipes and storm water runoff is conveyed in newer developments through a separate system to a storm water pond, or in older areas directly to a convenient stream, into which it is dumped with little and often no treatment. The age and condition of the underground piping system that coveys the water is related to the settlement pattern, with the District still utilizing some conveyance pipes from before the Civil War, and other close-in jurisdictions using pipes many decades old. A good deal of pollution to our waters occurs when these old piping systems break or otherwise leak.

Pollution thus enters the region's streams and rivers in one of four ways, three of them related to wastewater: 1) Through broken and leaking sewage pipes and connections; 2) Through the built-in overflows in the District's combined system, used when more rainwater enters the system than it can handle; 3) Through inadequate treatment at the region's wastewater treatment plants; and 4) perhaps most importantly, through storm water runoff conveyance systems which, as I noted earlier, often puts polluted runoff directly into a nearby stream without the benefit of treatment.

Here is one way to understand the phenomenon of urban and suburban water pollution: generations ago, humans generated very little pollution and the land acted as a filter, capturing whatever contaminants there were and keeping them out of the streams and rivers. Today, with hundreds of times as many contaminants as there once were, the land has been covered over with houses, buildings, concrete and asphalt and crisscrossed with subterranean pipes, creating two largely separate pollution funneling systems in place of what once was a filter. Today, the amount of pollution that enters our waters is directly related to how well we clean it up at the end of our wastewater and storm water funnel systems.

The 1972 federal Water Pollution Control Act (commonly known as the Clean Water Act) is the legal means through which the federal government attempts to limit pollution to the nation's waters. The Act works somewhat counter intuitively: the government issues periodic permits to pollute the water. Over time, the intention is to reduce the allowable amount of pollution to something near zero, thereby achieving the stated objective of the Act: "to restore and maintain the chemical,

physical, and biological integrity of the Nation's waters." Congress appears to have believed that this would happen easily and quickly, as the Act's next line set a national goal to eliminate pollutants to the nation's navigable waters by 1985.

The Clean Water Act has forced notable progress in cleaning up the nation's waters, particularly with regards to limiting end-of-the-pipe "point-source" pollution. It has been considerably less successful in forcing cleanup of "non-point source" pollution, such as urban and suburban storm water runoff, or runoff from agricultural lands. We obviously have missed the 1985 goal by more than two decades, and most observers would agree that the Act will not completely end water pollution - as Congress intended - any time soon.

In fact, there is much evidence that after having made significant progress in the 1970s and 1980s limiting pollution from point sources, the Clean Water Act is just not up to the task of finishing the job, and our nation's waters are once again in serious jeopardy. For example, the Chesapeake Bay, to which all the streams of the National Capitol Area flow, each year experiences large areas where there simply isn't enough oxygen in the water to allow fish and shellfish to live. The common and very descriptive name for these areas is "dead zones", and they are a result of the process of nutrient over-enrichment of water called eutrophication. Waters overloaded with too many nutrients – nitrogen and phosphorus being prominent among them – cause algae to multiply rapidly, which then causes a depletion of dissolved oxygen in the lower parts of the water column when the algae die and are consumed by zooplankton and bacteria.

Although you can't see the depletion of dissolved oxygen in the water, you can certainly see the green algal blooms in the Chesapeake Bay and on the tidal Potomac and other rivers in the warm months, and anyone with a boat and an electronic fish finder can observe that there are simply no fish in certain parts of the Bay and its tidal rivers during the warmer months of the year.

The recently released report of the Chesapeake Bay Program confirms that 88 percent of the Chesapeake Bay and its tidal tributaries did not meet water quality standards for dissolved oxygen during the 2005 to 2007 monitoring period. This is

sharply down from the 72 percent meeting such standards during the 2004-2006 period. Some of the decline can be attributed to annual weather variations, but the trend in recent years is strongly in the wrong direction.

The problem of too much nitrogen flowing into coastal waters and reducing the amount of dissolved oxygen is not confined to the Chesapeake Bay. According to the EPA, 44 estuaries along the nation's coasts are highly eutrophic and an additional 40 estuaries have moderate levels of eutrophic conditions. The annual dead zone in the Gulf of Mexico varies in size, but it recent years it has commonly exceeded the size of several small U.S. states.

So what does this all have to do with the greening of the National Capitol Region? Simply this: a big part of the solution to the dead zone in the lower Potomac and the Chesapeake Bay and stream degradation elsewhere is a particular kind of beneficial "greening". This beneficial greening has as its principal purpose to prevent the pollution from densely populated urban areas from entering our waterways.

The National Capitol Region has many examples of this kind of greening that is critical to the quality of area streams and rivers, and ultimately the Chesapeake Bay. Some of this beneficial greening has been driven by the Clean Water Act, and some has been voluntary. I want to focus briefly on two beneficial greening techniques that are being pursued with a high degree of energy in our area:

Reducing impervious areas and creating permeable landscapes From a water quality perspective, perhaps the most important greening effort in our region is the movement to prevent storm water runoff from entering into streams and rivers by reducing impervious cover and allowing storm water runoff to infiltrate into earth near where it falls. Generally, these types of efforts go by the names Low Impact Development and Environmental Site Design. The National Capitol Region is one of the nation's epicenters of Low Impact Development techniques, which were pioneered in Prince Georges County, and quickly adopted by the District, the surrounding suburban jurisdictions, and several federal agencies in this area. The Low Impact Development Center, a nonprofit consulting organization based in Prince Georges County, remains the national and international leader of such efforts.

Low Impact Development and Environmental Site Design techniques seek to retain the built environment as a part of the natural ecosystem, retaining, infiltrating, filtering, and evaporating water close to where it falls. Conservation of resources and preservation of open areas are also fundamental to the LID/ESD idea. Sites that incorporate LID techniques will mimic to the greatest possible degree pre-development hydrology. Relatively simple and decentralized techniques such as the use of bioretention areas (sometimes known as raingardens) and swales to capture, and retain water are more ecologically effective and often more cost effective than traditional stormwater treatment and disposal techniques.

One example of a low impact development bioretention area built under the supervision of the Architect of the Capitol exists on the Capitol grounds, but unfortunately for the House of Representatives, it is located on D Street, NE, between the Senate Office Buildings and Union Station.

A particularly important place for Low Impact Development and Environmental Site Design techniques is in connection with highways, which of course generate a significant load of vehicle-related pollution. The Green Highways Partnership - a voluntary, collaborative initiative of the EPA, the Federal Highways Administration, the Maryland State Highway Administration and several private partners - is attempting to integrate environmental infrastructure, including storm water management into the region's highways. It is cutting-edge, high potential work. This Committee will have an opportunity to encourage such techniques in the next Surface Transportation reauthorization, and I sincerely hope it will consider doing so.

In heavily urbanized areas where reducing impermeable surfaces and creating green space simply isn't feasible, retaining water on site and/or filtering it before allowing it to pass back slowly into a stream or river are acceptable alternatives. While not necessarily allowing for recharge of underground water, these techniques do provide multiple advantages for water quality and erosion control.

Building "green roofs" The National Capitol Region is one of two areas of the country that has demonstrated notable leadership in encouraging the installation

of "green" or vegetated roofs on public and private buildings. Green roofs designed for water quality improvement are essentially shallow basins built on roofs with several inches of manufactured soil and a layer of short plants, often from the sedum family. These roofs capture a high percentage of the rain that falls on them annually, holding it on the roof and allowing it to evaporate rather than funneling it to the stormwater or wastewater system. In doing so, they reduce both the quantity of runoff (which in the central part of the District frequently causes the old combined sewer to overflow) and the contaminants that have fallen onto the roof from the air.

Green roofs also have other environmental benefits in terms of helping to save energy costs and prevent localized "urban heat island" effects.

There may be as many as 25 commercial green roofs now installed or under construction in the National Capitol Region. One of the largest (at nearly 70,000 square feet) is on the new federal Department of Transportation buildings just south of the Capitol complex along the Anacostia River. Smaller, but more prominent, is the green roof that just opened over the left-field concession area at the new Nationals Stadium. I'm proud to say that the Chesapeake Bay Foundation was a partner with the DC government, the DC Water and Sewer Authority, and the Summit Fund of Washington in promoting and paying for each of those, as well as six others commercial and institutional ones in the Anacostia watershed.

Arlington County, the District, and the GSA have all been aggressive partners in promoting the construction of green roofs in this area. As a follow up to our incentive grant partnership, the District government is currently exploring the possibility of providing partial tax incentives to selected recipients to interest. The value of this incentive-based approach is that the public sector and the private sector share the costs of the green roof as well as its benefits.

It is essential that water quality protection techniques as green roofs, permeable landscapes, and storm water runoff retention be integrated into building and site design from the beginning of the process. Many of the jurisdictions in the National Capitol Region require strict storm water runoff standards for all new buildings and building sites. One outstanding example is the legislation passed by

the DC Council requiring all new public and publicly-assisted private buildings in the area around the Anacostia River to protect the river by meeting some of the strictest standards in the nation. Among other things, these new standards require retention and beneficial re-use of all rainwater up to and including a "one inch in 24 hour" storm. While for the moment these standards only apply to the Anacostia waterfront development area, I understand that the District's Department of the Environment is considering new rules to expand the strict standards to development in all parts of the city.

Madame Chairman, I have only touched on part of the critical water quality related "greening" going on the National Capitol Region. Those of us who live and/or work here can be quite proud of the efforts of the federal government and our local jurisdictions.

However, I want to end with a bit of realism. The fact is that these efforts are a good start, but are not nearly sufficient to restore the chemical, physical, and biological integrity of the region's waters, as was promised in the federal Clean Water Act. Moreover, most other urban and suburban jurisdictions in the Chesapeake Bay watershed and around the nation are far behind ours in their water quality related greening activities. Stormwater-related runoff continues to be one of the most significant factors in the Bay's degraded water quality. The conclusion seems inescapable that in order to reach the promise of the Clean Water Act, Congress needs to recognize the good greening work being done in our region, but also to do all in its power to require much more.